

## CLAIMS

1. An electronic assembly, comprising:
  - a substrate;
  - an electronic device having a first, second and third surface,

5 said electronic device supported by said substrate;

  - a heat pipe having a first and second segment, said first segment thermally coupled with said first surface of said electronic device;
  - and
  - a thermal transient suppression material thermally coupled with said first segment of said heat pipe and at least said second surface of said electronic device, said material having a component capable of absorbing thermal energy by phase change from a solid to a liquid and said material being self contained.

10
2. The electronic assembly of claim 1, wherein:
  - said thermal transient suppression material includes sufficient thermal capacity for receiving transient thermal energy produced by said electronic device; and
  - said heat pipe includes sufficient thermal capacity for receiving non-transient thermal energy produced by said electronic device and thermal energy received by said thermal transient suppression material.

15
3. The electronic assembly of claim 2, further comprising a heat dissipation device thermally coupled with said second portion of said heat pipe.
4. The electronic assembly of claim 3, wherein said heat dissipation device comprises a heat sink having cooling fins.

25

5. The electronic assembly of claim 4, wherein said heat sink comprises a first case portion.
6. The electronic assembly of claim 5, further comprising an elastomeric spring compressed between said first case portion and said first segment of said heat pipe, thereby maintaining said first portion of said heat pipe in thermal contact with said first surface of said electronic device.

30

7. The electronic assembly of claim 6, wherein said first case portion includes a recess, said recess receiving said elastomeric material.

35 8. The electronic assembly of claim 6, further comprising: a second case portion, said second case portion being thermally conductive; and

a thermally conductive coupling member thermally coupling said third surface of said electronic device with said second case portion.

40 9. The electronic assembly of claim 8, wherein said first surface and said third surface are located on opposite sides of said electronic device.

10. The electronic assembly of claim 9, wherein said substrate defines an aperture and said thermally conductive coupling member protrudes through said aperture.

45 11. The electronic assembly of claim 8, wherein said first case portion and said second case portion substantially enshroud said substrate and said electronic device therebetween.

50 12. The electronic assembly of claim 11, wherein said first case portion and said second case portion further substantially enshroud said heat pipe.

13. The electronic assembly of claim 2, further comprising a thermally conductive coupling member coupling said first surface of said electronic device and said first segment of said heat pipe.

55 14. The electronic assembly of claim 13, wherein said substrate defines an aperture and wherein said first surface of said device faces said aperture and said thermally conductive coupling member protrudes through said aperture.

60 15. The electronic assembly of claim 2, wherein said first segment of said heat pipe is formed to conform to the shape of said first surface of said electronic device.

16. The electronic assembly of claim 15, wherein said first segment of said heat pipe includes an external flattened portion in contact with said first surface of said electronic device.

17. The electronic assembly of claim 2, wherein said heat pipe includes a porous interior layer and liquid which is absorbable by said porous interior layer to provide heat conduction from said first segment to said second segment without requiring a mechanical pump.

18. The electronic assembly of claim 2, further comprising at least a second heat pipe thermally coupled with at least one of said first surface and said third surface of said electronic device.

19. The electronic assembly of claim 2, wherein said substrate includes a high current printed circuit board.

20. An electronic assembly, comprising:  
a high current circuit board; ✓  
a first electronic device supported by said circuit board and having a first, second and third surface;  
a heat conductive case having a first and second portion adjacent opposite sides of said circuit board; and  
a first heat pipe having a first segment thermally coupled with said first surface of said first electronic device and a second segment thermally coupled with said first case portion.

21. The electronic assembly of claim 20, further comprising a thermal transient suppression material in thermal contact with said second surface of said electronic device and said first segment of said first heat pipe.

22. The electronic assembly of claim 21, wherein:  
said thermal transient suppression material includes sufficient thermal capacity for receiving transient thermal energy produced by said first electronic device; and  
said first heat pipe includes sufficient thermal capacity for receiving non-transient thermal energy produced by said first electronic device and thermal energy received by said thermal transient suppression material.

23. The electronic assembly of claim 22, wherein said second case portion is in thermal contact with said third surface of said electronic device.

95 24. The electronic assembly of claim 23, wherein said first surface and said second surface are located on opposite sides of said electronic device.

100 25. The electronic assembly of claim 24, further comprising a thermally conductive coupling member coupled between said second case portion and said third surface of said electronic device, and wherein said circuit board defines an aperture and said coupling member protrudes through said aperture.

105 26. The electronic assembly of claim 23, further comprising an elastomeric spring compressed between said first segment of said heat pipe and said first case portion.

27. The electronic assembly of claim 23, further comprising:

110 a second electronic device supported by said circuit board; and a second heat pipe having a first segment and a second segment, said first segment of said second heat pipe thermally coupled with said second electronic device.

28. The electronic assembly of claim 27, wherein said second segment of said second heat pipe is thermally coupled with at least one of said first case portion and said second case portion.

115 29. The electronic assembly of claim 28, wherein said first electronic device and said second electronic device are coupled to opposite sides of said circuit board.

120 30. The electronic assembly of claim 22, wherein said first electronic device includes electrically conductive leads and said thermal transient suppression material is thermally coupled with said leads.

31. The electronic assembly of claim 22, wherein at least one of said first and second case portions comprises cooling fins.

32. The electronic assembly of claim 22, further comprising  
at least a second heat pipe coupled with at least one of said first surface and  
125 said second surface of said first electronic device.

33. A method of conducting heat away from an electronic  
device, comprising the steps of:

thermally coupling a heat pipe between the electric device and a  
heat sink; and

130 coupling a thermal transient suppression material to the  
electronic device and the heat pipe.

34. The method of claim 33, further comprising the  
steps of:

mounting the electronic device on a substrate;

135 coupling the substrate to the heat sink; and

providing a compressible material between the heat pipe and the  
heat sink adjacent the electronic device.

35. The method of claim 33, further comprising the step of  
shaping a portion of the heat pipe to provide improved thermal coupling with  
140 the electronic device.